What Is Claimed Is:

1. A method for receiving in a mobile station radio signals transmitted from a base station to at least one mobile station, the radio signals in the base station having symbols, being code-spread using one code for each mobile station, being predistorted in accordance with the expected transmission properties regarding each mobile station, and being modulated with regard to their phases, the method comprising:

code-despreading the radio signals transmitted from the base station;

determining the phases of the radio signals for each of the symbols to phase demodulate the radio signals;

mapping the determined phases onto a phase zone in accordance with a preestablished rule;

forming an average value from a preestablished number of the determined phases;

determining a phase correction factor from the average value; and

multiplying the phase correction factor by the demodulated radio signals in order to correct a phase error before the radio signals are detected.

2. The method of claim 1, wherein the phase correction factor is determined using scaling and conjugation of the average value.

3. The method of Claim 1, wherein the radio signals are modulated with respect to their phases and amplitudes.

4. A mobile station for transmitting and receiving radio signals, the mobile stations receiving code-spread radio signals and transmitting code-spread radio signals together with training signals, the radio signals having symbols, the mobile station receiving radio signals that have been predistorted in accordance with the expected transmission

properties of the radio channels, the mobile stations modulating, with regard to their phase, the radio signals to be transmitted, the mobile station comprising:

a receiver adapted to:

code-despread radio signals transmitted to the mobile station;

determine the phases of the radio signals for each of the symbols to phase demodulate the radio signals;

map the determined phases onto a phase zone in accordance with a preestablished rule; form an average value from the mapped phases;

calculate a phase correction factor from the average value; and

multiply the phase correction factor by the code-despread radio signals in order to correct a phase error before a data detector detects the radio signals.

5. The mobile station as recited in Claim 4, wherein the receiver calculates the phase correction factor by scaling and conjugating the average value.

6. The mobile station as recited in Claim 4, wherein the mobile station modulates the radio signals with respect to their phases and their amplitudes.

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